We Claim:

1. A bistable structure comprising:

a deflection element including mechanically constrained end points and a compliant span between the end points that is substantially free to deflect between two stable positions when a force is applied at a point along the span;

wherein the deflection element span is provided, as-fabricated, curved in one of the two stable positions and in a mechanically unstressed condition along span length;

wherein the as-fabricated curve of the deflection element span includes a curve maxima at a point along span length that is at least about ¼ of the span length from the end points of the span; and

wherein the deflection element span is constrained to substantially prohibit development of a second bending mode that is characteristic for the span as the element deflects between the two stable positions.

2. The bistable structure of claim 1 wherein the deflection element comprises a beam.

3. The bistable structure of claim 1 wherein the deflection element comprises two beams connected together at a point along the spans of the beams by an interconnecting clamp that prohibits development of a second bending mode that is characteristic for the spans as the element deflects between the two stable positions.

4. The bistable structure of claim 1 wherein the deflection element comprises a plate.

5. The bistable structure of claim 1 wherein the deflection element comprises a diaphragm.

6. The bistable structure of claim 1 wherein the constrained end points of the span are clamped.

7. The bistable structure of claim 1 wherein the constrained end points of the span are hinged.

8. The bistable structure of claim 1 wherein the constrained end points of the span comprises torsional spring elements.

9. The bistable structure of claim 1 wherein the span comprises aluminum.

10. The bistable structure of claim 1 wherein the span comprises silicon.

11. The bistable structure of claim 9 wherein the curve of the deflection element span corresponds to a lithographic mask defining the curve as-fabricated.

12. The bistable structure of claim 11 wherein the lithographic mask defines an etch mask pattern for etching the curve of the deflection element span.

13. The bistable structure of claim 1 wherein the curve of the deflection element span comprises a trajectory along the span length corresponding to a first bending mode characteristic for the span.

14. The bistable structure of claim 1 wherein the curve of the deflection element span comprises a trajectory along the span length defined as $\frac{\bar{d}(1-\cos(2\pi x/l)}{2}$, where $\bar{d}$ is the curve maxima value and x is the distance along the span length between 0 and l.

15. The bistable structure of claim 1 wherein the maxima of the curve of the deflection element span is located at substantially the center of the span.

16. The bistable structure of claim 1 further comprising a plurality of electrically conductive relay contacts disposed at positions that are separated from the deflection element by a separation distance selected such that an electrical connection is provided between the relay contacts when the deflection element is in one of the two stable positions.

17. The bistable structure of claim 16 wherein the electrical connection provided between the relay contacts comprises mechanical contact of each relay contact with an electrically conducting cross bar that is compliantly connected to the deflection element.

18. The bistable structure of claim 1 further comprising a force generation actuator including a mechanical force applicator that is disposed relative to the deflection element to apply a force to the deflection element span and that is connected to receive an electrical stimulus for applying the force.

19. The bistable structure of claim 18 wherein the electrical stimulus comprises an electrostatic actuation voltage.

20. The bistable structure of claim 18 wherein the electrical stimulus comprises a thermal actuation voltage.